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[Add a new sub-section to the Water Quality Control Plan for the North Coast Region implementation chapter (Chapter 4) with the following Action Plan for the Klamath River. This section will be added after the “Action Plan for the Shasta River Watershed Temperature and Nutrient TMDL.” In addition to adding the following language, several editorial revisions will be made, including appropriate changes to the Title Page, Table of Contents, Summary of Basin Plan Amendments (Appendix 1), page numbers, table and figure numbers, footnote numbers, and headers and footers to reflect the new language. The final locations of tables and figures in relation to the text may also be changed to accommodate the existing formatting of the Basin Plan.]

KLAMATH RIVER BASIN TOTAL MAXIMUM DAILY LOAD ACTION PLAN ADDRESSING TEMPERATURE, DISSOLVED OXYGEN, NUTRIENT, AND MICROCYSTIN IMPAIRMENTS IN CALIFORNIA¹

The Klamath River basin in California, which includes all tributaries, comprises approximately 12,680 square miles (7,414,761 acres) and is located in Del Norte, Humboldt, Trinity, Siskiyou and Modoc Counties. This *Klamath River Total Maximum Daily Load Action Plan Addressing Temperature, Dissolved Oxygen, Nutrient and Microcystin Impairments in California* (Klamath River TMDL Action Plan), includes temperature, nutrient, and organic matter total maximum daily loads (TMDLs) and describes the implementation actions necessary to achieve the TMDLs and attain water quality standards in the Klamath River basin. The goal of the Klamath implementation actions is to achieve the TMDLs, and thereby achieve temperature, dissolved oxygen, biostimulatory, and toxicity water quality standards, including the protection and restoration of the beneficial uses of water in the Klamath River basin. The Klamath River TMDL Action Plan sets out the loads and conditions to be considered and incorporated into regulatory and non-regulatory actions in the Klamath River basin.

I. Problem Statement

In 1996, the Klamath River mainstem was listed as impaired for organic enrichment/low dissolved oxygen (DO) from Iron Gate Reservoir to the Scott River, and for nutrient and temperature impairment in the remainder of the watershed (or basin) pursuant to section 303(d) of the Clean Water Act. In 1998, the Klamath River watershed was listed for nutrient and temperature impairment from Iron Gate Reservoir to the Scott River, and the Klamath River mainstem was listed for organic enrichment/low dissolved oxygen in the reaches upstream of Iron Gate Reservoir and downstream of the Scott River. Iron Gate and Copco Reservoirs and the intervening reach of the Klamath River were listed for microcystin impairment in 2006. The 303 (d) listings were confirmed in the Klamath River TMDL analysis.

Dissolved oxygen concentrations are regularly too low to comply with the Basin Plan dissolved oxygen objectives. Water temperature conditions regularly exceed temperature thresholds protective of salmonids. Low dissolved oxygen concentrations and elevated water temperatures in the Klamath River, its tributaries, Copco Reservoir, and Iron Gate Reservoir have resulted in degraded water quality conditions that do not meet applicable water quality objectives and that impair designated beneficial uses. The designated beneficial uses that are not fully supported include:

cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); and spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); Native American cultural use (CUL); subsistence fishing (FISH); and contact and non-contact water recreation (REC-1 and REC-2).

The designated beneficial uses associated with the cold freshwater salmonid fishery (COMM, COLD, RARE, MIGR, SPWN) and cultural resources (CUL, FISH) are the designated beneficial uses most sensitive to the dissolved oxygen and water temperature impairments. Important species in the Klamath River watershed include coho and Chinook salmon, trout, green sturgeon, and Pacific lamprey.

¹ Adopted by the North Coast Regional Water Quality Control Board on [insert date]. Adopted by the State Water Resources Control Board on [insert date]. Approved by the State Office of Administrative Law on [insert date]. Approved by the United States Environmental Protection Agency on [insert date].

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II. Watershed Restoration Efforts

Throughout the Klamath River watershed in California, many individuals, groups, and agencies have been working to enhance and restore fish habitat and water quality. These groups include, but are not limited to the United States Forest Service, the United States Fish and Wildlife Service, NOAA-Fisheries, the United States Bureau of Reclamation, the Natural Resource Conservation Service, the Klamath River Basin Fisheries Task Force, the California Department of Fish and Game, the California Department of Water Resources, the Klamath, Hoopa, Karuk, and Yurok Tribes, the Quartz Valley Indian Reservation, the Resighini Rancheria, the Five Counties Salmonid Conservation Program, local Resource Conservation Districts, the Mid Klamath Watershed Council, Klamath Riverkeeper, Friends of the River, the Klamath Forest Alliance, the Nature Conservancy, local irrigation districts, local watershed groups, and private timber companies. The past and present efforts of these stakeholders have improved water quality conditions in the Klamath River and its tributaries.

III. Temperature

A. Klamath River Temperature Source Analysis

The Klamath River watershed temperature TMDL addresses the heat loads that arise from seven sources:

1. Conditions of Klamath River water crossing the Oregon-California border (Stateline);
2. Thermal discharges from Copco 2 and Iron Gate Reservoirs;
3. The impoundment of water in the Copco 1, Copco 2, and Iron Gate Reservoirs;
4. Temperature effects of Iron Gate Hatchery;
5. Temperature effects of major tributaries on Klamath River temperatures;
6. Effects of excess solar radiation; and
7. Effects of excess sediment loads.

B. Klamath River Temperature TMDL

The Klamath River Temperature TMDL is set equal to the loading capacity. The loading capacity is the maximum amount of pollutant loading that can occur while still achieving water quality objectives and protecting beneficial uses. For the temperature TMDL the water quality objective of concern is the temperature objective, which prohibits the alteration of the natural receiving water temperature unless such alteration does not adversely affect beneficial uses. The loading capacity provides a reference for calculating the amount of pollutant load reduction needed to bring a water body into compliance with standards. The starting point for the load allocation analysis is the equation that describes the Total Maximum Daily Load or loading capacity:

$$\text{TMDL} = \text{Loading Capacity} = \Sigma \text{WLAs} + \Sigma \text{LAs} + \text{Natural Background}$$

where Σ = the sum, WLAs = waste load allocations, and LAs = load allocations. Waste load allocations are contributions of a pollutant from point sources, while load allocations are contributions from human-caused (anthropogenic) non-point sources.

This TMDL allocates no temperature increases year-round, thus the load and waste load allocations are zero, and the Temperature TMDL is:

$$\begin{aligned} \text{Temperature TMDL} &= \text{Loading Capacity} \\ &= 0 \text{ increase above natural background} \\ &= 0 \text{ anthropogenic heat load at stateline} \\ &\quad + 0 \text{ heat load discharged from Copco 2 and Iron Gate Reservoirs} \\ &\quad + 0 \text{ heat load discharge from Iron Gate Hatchery} \\ &\quad + 0 \text{ heat load from excess solar radiation} \\ &\quad + 0 \text{ heat load from anthropogenic sediment loads} \\ &\quad + \text{natural background.} \\ &= \text{natural background} \end{aligned}$$

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C. Klamath River Temperature Load Allocations

In accordance with the Clean Water Act, the Klamath River Temperature TMDL is allocated to the sources of elevated temperature in the watershed. The Iron Gate Fish Hatchery is the one point-source heat load in the Klamath River watershed. The interstate water quality objective for temperature prohibits the discharge of thermal waste to the Klamath River, and therefore the waste load allocation is set to zero. The TMDL includes elevated temperatures from natural and non-point anthropogenic sources. The non-point sources include: (1) excess solar radiation expressed as its inverse, shade; (2) heat loads associated with increased sediment loads; (3) heat loading from impoundments; and (4) heat loads from Oregon. The assigned load allocations for temperature are expressed in Table 4-15.

Table 4-15: Temperature Load Allocations

| Source | Allocation |
|---|--|
| Excess Solar Radiation (expressed as effective shade) | The shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire. |
| Increased Sediment Loads | Zero temperature increase caused by substantial human-caused sediment-related channel alteration. |
| Impoundment Discharges | Zero temperature increase above natural temperatures. |
| Reservoirs | See dual temperature - dissolved oxygen allocation, below in Section IV, C |
| Klamath River at Stateline | Zero increase above natural temperatures. |

D. Klamath River Temperature Margin of Safety, Seasonal Variations, and Critical Conditions

The Klamath River Temperature TMDL for California relies on an implicit margin of safety. The intrastate water quality objective for temperature allows for temperature increases of up to 5 °F if beneficial uses of water are not adversely affected. For much of the year the instream temperature of the Klamath River is too hot to accommodate more heat loading without beneficial uses of water being adversely affected. There are periods in the winter and spring months, however, when temperatures increases of up to 5 °F may occur without beneficial uses of water being adversely affected. The timing of those periods changes from year to year and is difficult to predict. Therefore, this TMDL takes a conservative approach, allocating no temperature increases year-round. This conservative approach constitutes an implicit *margin of safety*.

To account for annual and seasonal variability, the Klamath River temperature TMDL analysis evaluated temperatures and thermal processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for temperature, described above, which do not allow for temperature increases during any part of the year.

IV. Dissolved Oxygen

A. Klamath River Dissolved Oxygen Source Analysis

The Klamath River dissolved oxygen (DO) source analysis quantified nutrient and organic matter pollutant loads from fourteen geographic areas or entities (called 'source areas') within the Klamath River basin. Each source area has a different combination of source categories - processes at work which contribute to the load from that source area. The geographic source areas can be more generally grouped as follows:

- Stateline – waters entering California from Oregon at stateline, which includes the Williamson and Sprague River watersheds, Upper Klamath Lake, the Lost River watershed that drains the Klamath Project area and includes one municipal point source in California, municipal and industrial point sources to the Klamath River in Oregon, and Klamath River waters passing through Keno and JC Boyle Reservoirs. Oregon's Klamath River TMDL source analysis evaluates the contributions from these discrete sources on the water quality of the Klamath River in Oregon;
- PacifiCorp hydroelectric facilities in California: Copco 1 and 2 and Iron Gate Reservoirs – Copco 1 and 2 Reservoirs are treated as a single source for the purposes of this TMDL;
- Iron Gate Hatchery; and

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- Tributaries – Four individual rivers (Shasta, Scott, Salmon, and Trinity Rivers) are included as discrete source areas, while groups of smaller creeks are combined into six additional source areas (Stateline to Iron Gate reach tributaries, Iron Gate to Shasta, Shasta to Scott, Scott to Salmon, Salmon to Trinity, and Trinity to Turwar).

B. Klamath River Dissolved Oxygen TMDL

The TMDLs addressing dissolved oxygen and nutrient-related water quality impairments, including microcystin, are closely interrelated because of the strong relationship between biostimulatory conditions, decomposition of organic matter, and resulting dissolved oxygen conditions. The Klamath River TMDLs for California are calculated to attain and maintain site-specific DO objective for the Klamath River in California. The site-specific DO objective and associated DO load allocations are the primary driver in establishing the nutrient and organic matter loading capacity for the river reaches of the Klamath River in California. Stateline and tributary allocations for the nutrients (total nitrogen (TN) and total phosphorus (TP)) and organic matter (CBOD)² were set to ensure that the site-specific DO objectives are met in the river reaches in California. Thus, achievement of the Klamath River Nutrient and Organic Matter TMDLs constitutes achievement of the Klamath River Dissolved Oxygen TMDLs, except in the reservoirs, which were assigned additional nutrient load allocations, as described below.

C. Klamath River Dissolved Oxygen Load Allocations

Achievement of the nutrient and organic matter allocations at Stateline and the tributary nutrient and organic matter allocations will not result in compliance with the DO and temperature load allocations within Copco 1 and 2 and Iron Gate Reservoirs during periods of thermal stratification. Therefore, additional dissolved oxygen load allocations are assigned to the reservoirs for the period of May through October to ensure compliance with the DO and temperature objectives within the reservoirs, and ensure support of the cold freshwater habitat (COLD) beneficial use. The temperature and DO allocations for waters within Copco 1 and 2 and Iron Gate Reservoirs are dual allocations, wherein achievement of the water quality objective for temperature must coincide with dissolved oxygen conditions compliant with the site-specific DO objective, and vice versa. Allocations for dissolved oxygen and temperature equate to a “compliance lens” where both DO and temperature conditions meet Basin Plan objectives for water temperature and DO and are therefore protective of COLD.

The allocation applies during the critical period of May 1st through October 31st and requires that DO concentrations consistent with 85% saturation or better overlap temperatures consistent with natural water temperatures at the point of entry to the reservoirs within a lens throughout the reservoir.

The volume of each reservoir compliance lens is equal to the average hydraulic depth of the river in a free-flowing state for the width and length of the reservoir. The depth at which the compliance lens occurs within the reservoirs will vary. For Copco 1 and 2 and Iron Gate Reservoirs, the instantaneous DO mass that achieves the DO allocation equals 39,398 pounds (7.64 mg/L) and 47,624 pounds (7.60 mg/L), respectively³.

D. Klamath River Dissolved Oxygen Margin of Safety, Seasonal Variations, and Critical Conditions

To account for annual and seasonal variability, the Klamath River Dissolved Oxygen TMDL analysis evaluated DO processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for nutrients and organic matter, described below in Section V, which are set to ensure that the site-specific DO objectives are met in the river reaches in California, and by the DO load allocations, which define DO concentrations in each of the twelve months of the year. The margin of safety for the Dissolved Oxygen TMDL is addressed in Section V.D.

² The allocations for organic matter are expressed as CBOD, and refer to CBOD-ultimate. The water quality models represent CBOD as organic matter; it is converted to CBOD-ultimate for TMDL allocation calculations.

³ The instantaneous DO masses for Copco and Iron Gate Reservoirs were calculated from the depth within each reservoir at which temperatures achieved California compliance scenario temperatures. The volume within the compliance lens was calculated from the depth at which compliance is achieved to the thickness associated with the reach-average depth of the free-flowing river channel for the entire width of the reservoir at these depths. This volume estimate was then multiplied by the average 85% DO saturation concentration calculated from the California compliance scenario to get the instantaneous DO mass for each reservoir.

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V. Nutrients and Organic Matter

A. Klamath River Nutrient and Organic Matter Source Analysis

The Klamath River Nutrient, Organic Matter, and Dissolved Oxygen TMDLs rely on a single source analysis. That source analysis is described in section IV.A above.

B. Klamath River Nutrient and Organic Matter TMDL

The TMDLs for total phosphorus (TP), total nitrogen (TN), and organic matter (CBOD) for the Klamath River in California are the sum of waste load allocations, load allocations, and natural background for each parameter. The only waste load allocations assigned for these TMDLs is to the Iron Gate Hatchery. The contribution of natural background TP, TN, and CBOD loads is incorporated into the load allocations for each source area. Accordingly, the TMDL equations for TP, TN, CBOD take the form of the following equation:

$$\text{Nutrient TMDLs} = \text{Loading Capacity} = \Sigma \text{WLAs} + \Sigma \text{LAs}$$

Daily load and waste load total phosphorus, nitrogen, and organic matter allocations for the Klamath River in California are presented in Table 4-16. These daily loads are those that achieve the TMDLs.

Table 4-16: Nutrient and Organic Matter Allocations (lbs/day)

| Source Area | Daily Phosphorous Load (lbs.) | Daily Nitrogen Load (lbs.) | Daily Organic Matter Load (lbs.) |
|-------------------------------------|-------------------------------|----------------------------|----------------------------------|
| Stateline | 310.2 + | 4.031.9 + | 26,171.9 + |
| Upstream of Copco 1 | (204.3) + | (1,041) + | (19,628.9) |
| Stateline to Iron Gate inputs | 164.8 + | 1,101 + | 10,649 + |
| Δ Iron Gate Hatchery | 0 + | 0 + | 0 + |
| Iron Gate to Shasta tributaries | 48.5 + | 317 + | 3,039 + |
| Shasta River | 74.8 + | 220 + | 2,406 + |
| Shasta to Scott tributaries | 17.3 + | 97 + | 871 + |
| Scott River | 87.4 + | 1,279.0 + | 13,607.7 + |
| Scott to Salmon tributaries | 186.9 + | 1,050 + | 9,423 + |
| Salmon River | 192.6 + | 1,583.4 + | 18,428.5 + |
| Salmon to Trinity tributaries | 89.6 + | 504 + | 4,519 + |
| Trinity River | 827.9 + | 6,232.4 + | 72,692.2 + |
| Trinity River to Turwar tributaries | 178.6+ | 1,004 + | 9,007 + |
| Total | 1,974.3 | 16,378.6 | 151,185.4 |

C. Klamath River Nutrient and Organic Matter Load Allocations

The loading capacity and associated load and waste load allocations for total phosphorus (TP), total nitrogen (TN), and organic matter (CBOD) for the Klamath River in California, including Copco 1 and 2 and Iron Gate Reservoirs, are presented in Figures 4.6, 4.7, and 4.8, respectively. These figures present the loading capacities divided into various reaches of the Klamath River in California, and also present the load and waste load allocations assigned to the different sources necessary that are needed to achieve the loading capacity. For most Klamath River compliance locations, allocations have been set as monthly mean concentrations for nutrients (TP and TN) and organic matter (CBOD). Table 4.16 presents the same allocations expressed in lbs/day.

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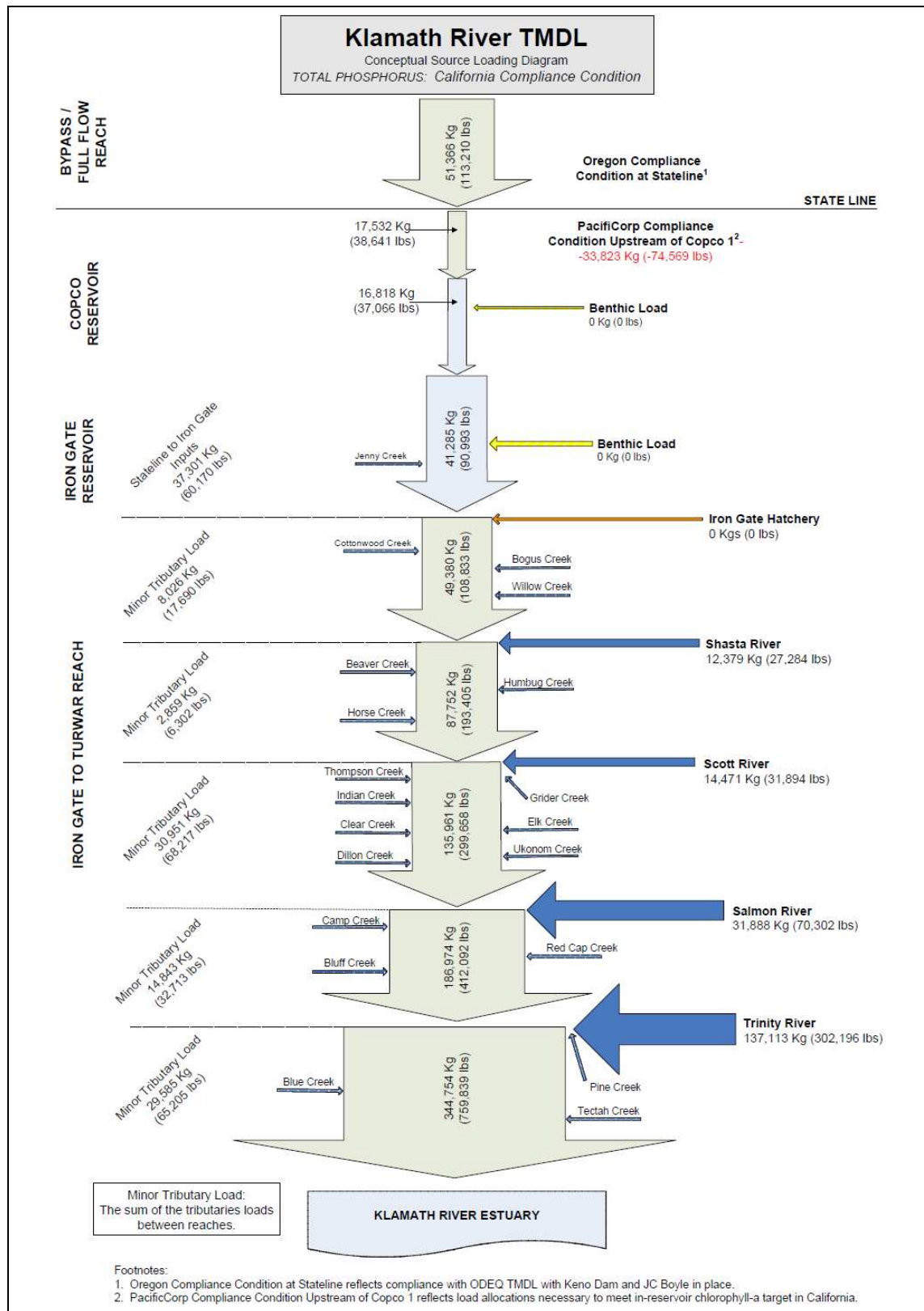


Figure 4.6: Annual Total Phosphorous Loading Capacity and Allocations for the Klamath River in California.

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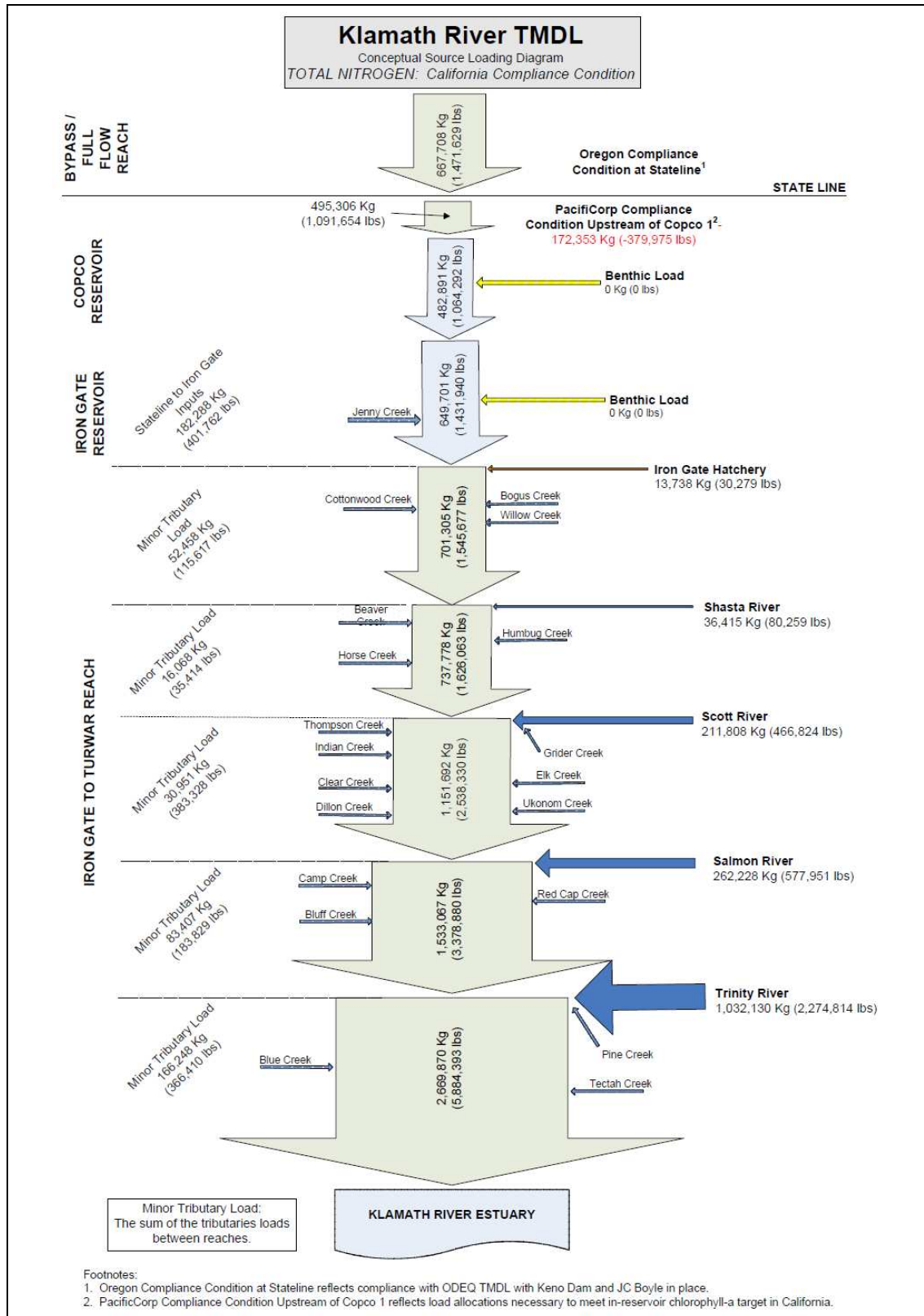


Figure 4.7: Annual Total Nitrogen Loading Capacity and Allocations for the Klamath River in California.

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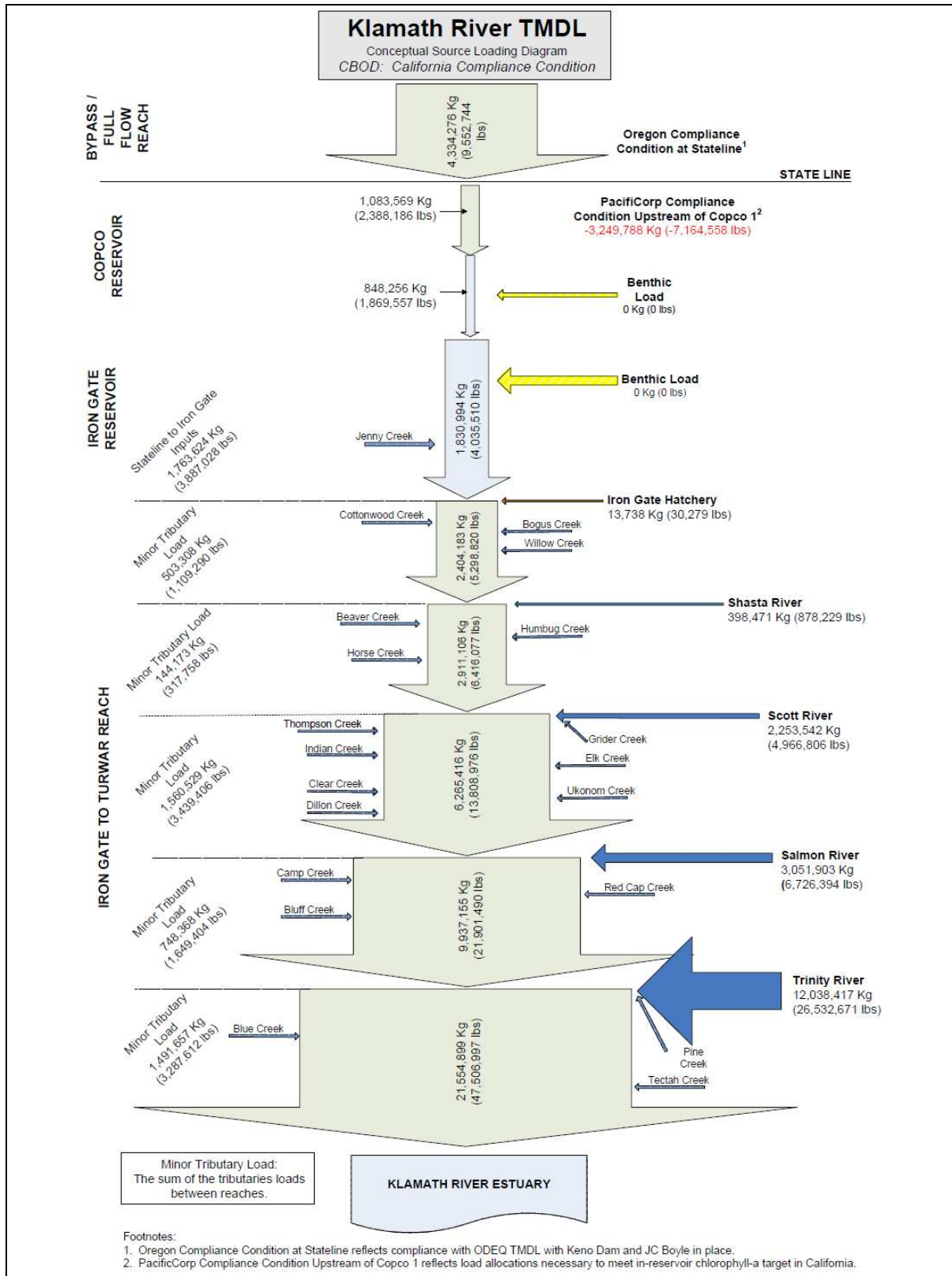


Figure 4.8: Annual Organic Matter (CBOD) Loading Capacity and Allocations for the Klamath River in California.

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D. Klamath River Nutrient and Organic Matter Margin of Safety, Seasonal Variations, and Critical Conditions

The Klamath River Dissolved Oxygen, Nutrient, and Organic Matter TMDLs rely on an implicit margin of safety. An implicit margin of safety was deemed appropriate because uncertainty was reduced in the analysis by applying a comprehensive, dynamic numerical model. The model takes advantage of available data collected over multiple years, and deterministically represents the cause-effect relationship between discrete sources and water quality conditions throughout the Klamath's riverine, reservoir, and estuarine portions. By representing conditions in great detail spatially and temporally, the model effectively considers a spectrum of conditions that may be overlooked by a simpler analysis. It was determined that the largest source of uncertainty in this system is the highly variable and dominant loading from Upper Klamath Lake rather than the numeric water quality model. Conservative assumptions that make up the implicit margin of safety are as follows:

- The numeric model used to predict the impact of allocations assumes that sediment oxygen demand (SOD) does not improve in the riverine sections following upstream load reductions. The magnitude of SOD will likely decrease with the decrease of organic loading allocated by the TMDL, and result in increased DO concentrations over time.
- Predicted conditions in the Klamath River are strongly influenced by the predicted variable conditions of the Upper Klamath Lake TMDL. Conservative allocations were set by using a combination of the predicted conditions. The timing of the allocations within Oregon is based on the scenario which represents the greatest loading from Upper Klamath Lake (i.e. results in the longest period of water quality not meeting numeric criterion). The magnitudes of the allocations are based on median loading conditions from Upper Klamath Lake. This is conservative because allocations are based on the difference from a baseline condition. The closer the concentration or temperature is to the numeric criteria, the less loading is necessary to cause a measurable degradation.
- Allocations to nonpoint source are for all nutrients (TN, TP, and CBOD), not just the predicted limiting nutrient.
- Year 2000 flows are less than more recent flow requirements (i.e. USBR Klamath Project Operations and PacifiCorp Klamath Hydro Project Biological Opinion flows).

VI. Microcystin

Allocations for nutrients (TP and TN) are assigned to PacifiCorp, or any future owners or operators of Copco 1 and 2 and Iron Gate Reservoirs, in order to achieve the in-reservoir chlorophyll-a, *Microcystis aeruginosa* and microcystin conditions protective of beneficial uses. These allocations apply to PacifiCorp and are to be achieved at a location upstream of Copco 1. These annual allocations equal:

- 38,641 pounds TP;
- 1,091,654 pounds TN;

and equate to the following annual reductions below the nutrient allocations at stateline:

- 74,569 pounds TP;
- 379,975 pounds TN.

In addition, to account for the flux of nutrients (e.g., ammonia and orthophosphate) from reservoir bottom sediments under anoxic conditions during the critical period May through October, a nutrient allocation for Copco 1 and 2 and Iron Gate Reservoirs of zero nutrient loading from reservoir bottom sediments is established.

The margin of safety, seasonal variations, and critical conditions for the Microcystin TMDL is addressed in Section V.D above.

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VII. Implementation Plan

The implementation plan describes the specific actions that the Regional Water Board and other responsible parties shall implement to achieve the TMDLs and meet temperature, dissolved oxygen, biostimulatory, and toxicity water quality standards in the Klamath River basin. The actions are organized into a table (Table 4-17) by source or land use activity and by the responsible party(ies) considered appropriate to implement TMDL actions. Responsible parties may find that more than one implementation action is applicable to their circumstances. Action items are fully independent from each other and require 100% implementation within each Source or Land Use category. The implementation actions are designed to encourage and build upon on-going, proactive restoration and enhancement efforts in the watershed. Additionally, the implementation actions described in Table 4-17 are necessary to comply with the California's Nonpoint Source Pollution Control Program (NPS Policy). The NPS Policy requires the Regional Water Board to regulate all nonpoint source discharges of waste through some combination of regulatory mechanisms that include WDRs, conditional waivers of WDRs, and Basin Plan prohibitions.⁴ For all currently unregulated nonpoint source discharges of waste in the Klamath River basin, the implementation plan directs the Regional Water Board to develop one or more regulatory mechanisms to control the discharge and meet the TMDL load allocations. The implementation plan assigns a timeframe for the development of each of these mechanisms as well as for the other required actions. The implementation plan also includes a sediment waste discharge prohibition and a prohibition on the discharge of waste within specified instream buffer areas in and around known thermal refugia.

Klamath River TMDL Conditional Waiver

Concurrent with adoption of this Klamath River TMDL Action Plan, the Regional Water Board is adopting a conditional waiver that waives the requirement to file a Report of Waste Discharge (ROWD) and obtain Waste Discharge Requirements (WDRs), pursuant to Water Code section 13269, for discharges addressed by this TMDL Action Plan that are not already regulated through existing WDRs, waivers, or prohibitions. The waiver only applies to dischargers that choose to participate in the on-going collaborative programs and implement the Klamath River TMDL implementation measures, including the prohibition on the discharge of excess sediment, as applicable, as described in Table 4-17. Should a discharger choose not to participate, or if the Regional Water Board's Executive Officer determines additional measures are necessary and provides the discharger with written notice to that effect, the discharger must submit a Report of Waste Discharge (RWD) and filing fee to the Regional Water Board immediately or in accordance with the written notice.

If the implementation actions identified in Table 4-17 fail to be implemented by the responsible party or if the implementation actions prove to be inadequate the Regional Water Board shall take additional permitting and/or enforcement actions, as necessary. The waiver is meant to provide interim coverage while certain land use specific waivers/WDRs are developed. The conditional waiver shall not apply to any discharges for which a WDR, waiver, or prohibition is issued under a separate action of the Board. The conditional waiver expires upon Regional Water Board adoption of a superseding regulatory action, or after five years, whichever occurs first. This waiver will be conditional and may be terminated at any time by the State or Regional Water Board.

Conditional Prohibition on the Discharge of Excess Sediment in the Klamath River Basin

The discharge or threatened discharge of excess sediment from human caused activities to waters of the state in the Klamath Basin is prohibited.

Excess sediment is defined herein as soil, rock, and/or sediments (e.g. sand silt, or clay) discharged to waters of the state in an amount that could be deleterious to beneficial uses or cause a nuisance.

⁴ The Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy).

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Parties conducting land use activities in the Klamath Basin that have the potential to discharge sediment are required to implement the following sequential compliance measures:

1. Prevent – Plan, design, and implement the project or activity in such a way that no excess sediment discharge occurs or could occur to waters of the state.
2. Minimize – If the discharge or threatened discharge of excess sediment cannot be fully prevented, then plan, design, and implement the project in such a way that discharges to waters of the state are minimized to the maximum extent possible.

Parties responsible for existing sediment sources must implement the following measures:

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).
2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
3. Schedule: Develop a schedule to implement the cleanup of controllable sediment discharge sites.
4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.

Responsible parties actively engaged in implementation of these measures will be considered on a path towards compliance with the prohibition on the discharge of excess sediment and the Klamath River TMDLs. In cases where preventive or corrective action has not taken place, the Regional Water Board and/or staff will take the appropriate enforcement measures pursuant to the Statewide Enforcement Policy. Further, the NPS Policy provides the Regional Water Board the discretion to waive application or enforcement of the prohibition for a particular discharge based on the circumstances of the case.

Prohibition on the Discharge of Waste Within a Specified Instream Buffer Area In and Around Known Thermal Refugia Locations in the Klamath River Basin

Responsible parties conducting instream activities in the Klamath Basin are prohibited from discharging waste in and around known thermal refugia within a specified instream buffer unless that activity is already regulated by a separate regulatory mechanism such as WDRs, waiver(s) of WDRs, and/or a 401 water quality certification. The known thermal refugia locations and site-specific buffers are given in the Klamath River TMDL Staff Report and are subject to change based on periodic review by the Regional Board Executive Officer. The default instream buffer for all thermal refugia in the Klamath Basin is 500 ft from the tributary confluence with the mainstem river in both the upstream and downstream direction and also upstream into the tributary. Parties conducting instream activities in the Klamath Basin, including suction dredging activities, are responsible for being familiar with the thermal refugia locations and conducting their activities outside the specified buffer area.

Actions to Address the TMDL Impairments

The actions to address the TMDL impairments and the corresponding responsible parties are presented in Table 4-17 below.

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|--|
| Stateline Allocations Regional Water Board Oregon (ODEQ) USEPA 9 and 10 | <u>Action</u> Work together as specified in the Klamath River/Lost River TMDL Implementation Memorandum of Agreement developed to implement and monitor measures that will achieve compliance with the Klamath and Lost River TMDLs in Oregon and California. |
| Klamath Irrigation Project (KIP) Regional Water Board US Bureau of Reclamation (USBR) US Fish and Wildlife Service (USFWS) | <u>Action</u> Develop and implement a Management Agency Agreement (MAA) between USBR, USFWS and the Regional Board that addresses the water quality impacts of the Klamath Irrigation Project (KIP). The MAA should include the following action items: <ul style="list-style-type: none"> ▪ Complete a water quality study to characterize the seasonal and annual nutrient and organic matter loading through the KIP and refuges. The study should be completed in time to inform the development of a water quality management plan to be submitted to the Regional Water Board within 18 months of Regional Water Board approval of the Klamath River TMDLs; ▪ Develop a water quality management plan to meet the Lost River and Klamath River TMDL allocations. The plan should be submitted to the Regional Water Board for approval within 18 months of approval of the Klamath River TMDLs. ▪ Include a schedule with interim milestones for meeting the TMDL allocations; ▪ Coordinate implementation actions with other responsible parties discharging pollutants within the KIP and refuges; ▪ Develop a monitoring and reporting program with the Regional Water Board to evaluate the effectiveness of management measures and track progress towards meeting TMDL allocations; ▪ Coordinate with the Klamath River water quality improvement accounting and tracking program in implementing offset projects; and ▪ Periodically report to the Regional Water Board on actions taken to implement the TMDL and progress towards meeting the TMDL allocations. <u>Timeline</u> Within six months of Regional Water Board adoption of the Klamath River TMDL Action Plan. |
| Klamath Hydroelectric Project PacifiCorp | <u>Action</u> Submit a proposed implementation plan for approval by the Regional Water Board that includes implementation measures to meet TMDL allocations, a timeline for implementation, measureable milestones, and a provision to periodically update the plan. <u>Timeline</u> Within 60 days of Regional Water Board adoption of the Klamath River TMDL Action Plan. <u>Action</u> Implement measures to meet and/or offset TMDL allocations as prescribed in the approved implementation plan. <u>Timeline</u> As required by the approved implementation plan. |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|---|---|
| Klamath Hydroelectric Project State Water Resources Control Board | <u>Action</u> Include measures in the 401 water quality certification for the Federal Energy Regulatory Commission (FERC) relicensing of the Klamath Hydroelectric Project to meet and/or offset Klamath TMDL allocations. <u>Timeline</u> Pursuant to the FERC licensing process timeline. |
| Iron Gate Hatchery Regional Water Board | <u>Action</u> Revise NPDES Permit No. 0006688 and WDR No. R1-2000-17 to include a compliance schedule and ensure that the discharge requirements are consistent with the load allocations necessary to comply with the TMDL. <u>Timeline</u> Adoption by the Regional Water Board by December 2010. |
| Iron Gate Hatchery Pacificorp CDFG | <u>Action</u> Implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet the TMDL allocations. <u>Timeline</u> As specified in the revised NPDES permit. |
| Excess Sediment Sources Responsible Parties (Any Party Conducting Activities with the Potential to Discharge Sediment) | <u>Action</u> If the discharge is not already being regulated by WDRs and/or waiver(s) of WDRs, comply with the prohibition on the discharge of excess sediment adopted as part of this Implementation Plan. <u>Timeline</u> Responsible Parties shall comply with the excess sediment prohibition immediately upon USEPA adoption of the Klamath River TMDL Action Plan. |
| Instream Discharge Sources Responsible Parties (Any Party Conducting Instream Activities, including Suction Dredging Activities, in the Klamath River basin with the Potential to Discharge Waste) | <u>Action</u> If the discharge is not already being regulated by WDRs, waiver(s) of WDRs, and/or a 401 water quality certification, comply with the prohibition on the discharge of waste within a specified instream buffer area in and around known thermal refugia locations in the Klamath River basin. <u>Timeline</u> This prohibition will take effect immediately upon USEPA adoption of the Klamath River TMDL Action Plan. |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|---|---|
| <p>Road Construction and Maintenance on Private Lands</p> <p>Responsible Parties (Any party responsible for the construction and/or maintenance of roads in the Klamath River basin)</p> | <p><u>Action</u> For discharges from roads not regulated through WDRs or a waiver of WDRs, or the construction stormwater permit, implement management practices in compliance with the prohibition of excess sediment discharge.</p> <p><u>Timeline</u> Road maintenance is a continuous process requiring a sustained effort to prevent and minimize sediment sources. Existing sediment sources should be addressed pursuant to a prioritized time schedule that is updated at least annually.</p> |
| <p>Road Construction and Maintenance on County Lands</p> <p>Regional Water Board</p> | <p><u>Action</u> The Regional Water Board shall adopt a resolution certifying the Five Counties Salmonid Conservation Program (5C Program) will comply with the TMDL and attain standards in accordance with California Impaired Waters Guidance⁵ and adopt an accompanying waiver for maintenance of county roads in the Klamath River basin.</p> <p><u>Timeline</u> Concurrent with Regional Water Board adoption of the Klamath River TMDL Action Plan.</p> <p><u>Action</u> In the event that a county does not show intent to implement the 5C Program, develop WDRs or a conditional waiver of WDRs for that county.</p> |
| <p>Road Construction and Maintenance on County Lands</p> <p>Del Norte, Humboldt, Siskiyou, Trinity, Modoc Counties</p> | <p><u>Action</u> For Del Norte, Humboldt, Siskiyou, and Trinity County, implement measures through the 5C Program.</p> <p><u>Timeline</u> Pursuant to the 5C Program timelines.</p> |

⁵ In any resolution certifying that another entity's program will comply with the TMDL and attain standards, the Regional Water Board must demonstrate in the resolution that the implementing program is consistent with the assumptions and requirements of the TMDL, that sufficient mechanisms exist to provide reasonable assurances that the program will address the impairment in a reasonable period of time, and that sufficient mechanisms exist to ensure that the program will be enforced, or that the Regional Water Board has sufficient confidence that the program will be implemented such that further regulatory action would be unnecessary and redundant. (A Process for Addressing Impaired Waters in California, SWRCB Resolution No. 2005-0050 (June, 2005) at 6-10.)

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|---|
| <p>Road Construction and Maintenance of State Highway Facilities</p> <p>State Water Resources Control Board</p> | <p><u>Action</u> Incorporate the following measures into the NPDES Statewide Storm Water Permit and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans permit) to address sediment sources from road and highway facilities under Caltrans control:</p> <ol style="list-style-type: none"> 1. <u>Inventory</u>: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s). 2. <u>Prioritize</u>: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility. 3. <u>Schedule</u>: Develop a schedule to implement the cleanup of controllable sediment discharge sites. 4. <u>Implement</u>: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge. 5. <u>Monitor and Adapt</u>: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards. <p><u>Action</u> Incorporate into the Caltrans permit the Senate Bill 857 requirements to inventory and remediate barriers to fish migration caused by Caltrans road and highway facilities along the mainstem of the Klamath River.</p> <p><u>Action</u> Incorporate into the Caltrans permit and water quality certifications the requirement the meet the riparian shade allocations.</p> <p><u>Timeline</u> The revised permit is anticipated to be adopted by the State Water Resources Control Board by April 2010, with USEPA adoption anticipated by August 2010.</p> |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|---|--|
| <p>Road Construction and Maintenance of State Highway Facilities</p> <p>Caltrans</p> | <p><u>Action</u> Implement the measures outlined above to control the discharge of excess sediment from their facilities and comply with the Klamath TMDL allocations.</p> <p><u>Action</u> Fully assess all barriers and potential barriers to fish passage caused by Caltrans road and highway facilities along the mainstem of the Klamath River. Develop a priority ranking and time schedule for modifying the identified fish passage barriers to accommodate free passage of fish upstream and downstream. The priority rank should consider the potential of the stream to function as a thermal refugium in the Klamath River mainstem.</p> <p><u>Action</u> Implement measures to meet the riparian shade allocation.</p> <p><u>Timeline</u> Caltrans shall submit annual reports to the Regional Water Board documenting measures taken: (1) to address fish passage barriers caused by its facilities; (2) to control excess sediment; and (3) to meet riparian shade allocations. These measures shall be implemented regardless of whether the State Water Board incorporates appropriate provisions into the revised Caltrans permit.</p> |
| <p>Grazing Activities on Nonfederal Lands</p> <p>Regional Water Board</p> | <p><u>Action</u> Develop a conditional waiver of WDRs and/or general WDRs for grazing activities in the Klamath River basin. The waiver/WDRs shall require compliance with the existing TMDL load allocations in the Scott and Shasta River basins in addition to the watershed-wide allocations in the Klamath River basin.</p> <p><u>Timeline</u> Regional Board staff shall propose the waiver/WDRs for Regional Board consideration by December 2013.</p> <p><u>Action</u> The Regional Board Executive Officer may require the submittal of a ranch water quality management plan that includes implementation measures and a time schedule for meeting the TMDL allocations.</p> <p><u>Timeline</u> As needed.</p> |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|---|---|
| <p>Grazing Activities on Non-Federal Lands</p> <p>Responsible Parties (Any party conducting grazing activities on non-federal land in the Klamath River basin)</p> | <p><u>Action</u> Develop and implement a ranch water quality management plan to implement the TMDL on a prioritized schedule or implement measures pursuant to an existing plan. The water quality management plan shall include the following:</p> <ul style="list-style-type: none"> ▪ A description of the existing beneficial uses to be protected from grazing activities. ▪ A survey of sediment sources and a time schedule for implementing measures to address those sediment sources as required by the prohibition on the discharge of excess sediment. ▪ An inventory of riparian vegetation conditions and a plan to monitor progress towards meeting the watershed-wide riparian shade allocation. ▪ Nutrient and organic matter control measures including limiting livestock access to the stream channel. ▪ Tracking and effectiveness monitoring of pollution control practices implementation. <p><u>Timeline</u> Within two years of USEPA approval of the Klamath River TMDL Action Plan.</p> |
| <p>Activities Associated with Irrigated Agriculture</p> <p>Regional Water Board</p> | <p><u>Action</u> Develop a conditional waiver of WDRs and/or general WDRs for activities associated with irrigated agriculture. The waiver/WDRs shall require compliance with the existing TMDL load allocations in the Scott and Shasta River basins in addition to the watershed-wide temperature and nutrient allocations in the Klamath River basin. .</p> <p><u>Timeline</u> Regional Board staff shall propose the waiver/WDRs for Regional Board consideration by December 2012.</p> <p><u>Action</u> The Regional Board Executive Officer may require the submittal of a water quality management plan that includes implementation measures and a time schedule for meeting the TMDL allocations.</p> <p><u>Timeline</u> As needed.</p> |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|---|
| <p>Activities Associated with Irrigated Agriculture</p> <p>Responsible parties (Any party conducting activities associated with irrigated agriculture in the Klamath River basin)</p> | <p><u>Action</u> Develop and implement a water quality management plan to implement the TMDL on a prioritized schedule or implement measures pursuant to an existing plan. The water quality management plan shall include the following:</p> <ul style="list-style-type: none"> ▪ A description of the existing beneficial uses to be protected from activities associated with irrigated agriculture ▪ A survey of sediment sources and a time schedule for implementing measures to address those sediment sources as required by the prohibition on the discharge of excess sediment ▪ Development of a nutrient management plan to control the application of excess fertilizer ▪ Implementation of control measures to reduce or eliminate irrigation tailwater discharges that contain elevated nutrient, organic matter and temperature loads ▪ Tracking and effectiveness monitoring of pollution control practices selected for implementation. <p><u>Timeline</u> Within two years of USEPA approval of the Klamath River TMDL Action Plan.</p> |
| <p>Timber Harvest Activities on Non-Federal Lands enrolled in conditional waiver</p> <p>Responsible Parties (Any party conducting timber harvest activities in the Klamath River basin operating under the conditional waiver.)</p> | <p><u>Action</u> Timber harvest activities covered under the conditional waiver of WDRs shall comply with the conditions described in the waiver.</p> |
| <p>Timber Harvest Activities on Non-Federal Lands</p> <p>Responsible Parties (Any party conducting timber harvest activities in the Klamath River basin.)</p> | <p><u>Action</u> Timber harvest activities covered under the conditional waiver of WDRs shall comply with the conditions described in the waiver.</p> <p><u>Action</u> Implement the 2009 edition of the California Forest Practice Rules including the Threatened and Impaired Rules watershed-wide for timber harvest activities in the Klamath River basin. Any subsequent revisions to the Forest Practice Rules shall be implemented given they are at least as stringent as the current requirements.</p> <p><u>Action</u> Responsible parties shall not conduct timber harvest activities within the channel zone of Class III watercourses⁶ within the Klamath River basin, except for use and maintenance of roads and crossings.</p> <p><u>Action</u> Meet the riparian shade allocation in all Class I and II⁷ watercourses by implementing</p> |

⁶ Class III watercourses are defined by the California Forest Practice Rules as having "No aquatic life present, watercourse showing evidence of being capable of sediment transport to Class I and II waters under normal high water flow conditions after completion of timber operations.

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|--|
| | <p>the following steps to determine the appropriate riparian harvest prescription in a THP in the Klamath River basin:</p> <ol style="list-style-type: none"> 1. Determine the current condition of the riparian vegetation in the THP area by measuring the current overstory canopy shade percentages. 2. Compare these percentages to the following reference shade conditions established by the Regional Water Board as being compliant with the TMDL: <p><i>Reference Shade Conditions</i> For Class I streams in the Klamath River basin: 85% overstory canopy within the first 75 feet of the Watercourse and Lake Protection Zone (WLPZ) and 65% overstory canopy for the remaining 75 ft.</p> <div style="text-align: center;"> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>65% canopy</p> <p>←-----75ft-----→</p> </div> <div style="text-align: center;"> <p>85% canopy</p> <p>←-----75ft-----→</p> </div> </div> <p>←-----150 ft. WLPZ-----→</p> <p style="text-align: right;">Class I Stream</p> </div> <p>For Class II streams in the Klamath Basin: 85% overstory canopy within the first 50 feet of the WLPZ and 65% overstory canopy for the remaining 50 ft.</p> <div style="text-align: center;"> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>65% canopy</p> <p>←-----50ft-----→</p> </div> <div style="text-align: center;"> <p>85% canopy</p> <p>←-----50ft-----→</p> </div> </div> <p>←-----100 ft. WLPZ-----→</p> <p style="text-align: right;">Class II Stream</p> </div> <ol style="list-style-type: none"> 3. Where the existing overstory canopy is greater than the reference condition, timber harvest activities shall not reduce the overstory canopy below the reference conditions. Where the existing overstory canopy is less than the reference conditions, or when the majority of trees (greater than 50%) are below their full site potential height, all trees that are providing shade to a Class I or Class II stream during the critical summer months (June-September), including trees outside of the WLPZ, shall be retained. Alternative prescriptions that provide equal or better protections may be proposed for consideration by the Regional Water Board Executive Officer as part of the THP or NTMP review process. Any tree providing shade to a Class I or II watercourse located outside of the WLPZ needed to meet the temperature load allocation shall be marked as a 'leave tree'. |
| <p>Timber Harvest Activities on Non-Federal Lands</p> <p>Regional Water Board</p> | <p><u>Action</u></p> <p>As needed, the Regional Board shall adopt individual watershed-wide and ownership WDRs, in lieu of the general WDR or conditional waiver of WDRs, to achieve the TMDL load allocations and water quality standards and/or at the request of the discharger.</p> |

⁷ Class I watercourses are defined by the California Forest Practice Rules as "Domestic supplies, including springs, on site and / or within 100 feet downstream of the operations area and / or; fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning. Class II watercourses are defined as "Fish always or seasonally present offsite within 1000 feet downstream and / or; aquatic habitat for nonfish aquatic species; and excludes Class III waters that are tributary to Class I waters".

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|---|---|
| All Activities on USFS Lands Regional Water Board | <u>Action</u> Develop conditional waivers of WDRs specific to each National Forest in the Klamath River basin to control discharges from all activities on USFS lands that have the potential to impact water quality. <u>Timeline</u> The conditional waivers shall be developed for Regional Water Board consideration pursuant to the following schedule for each National Forest: <ul style="list-style-type: none"> • Klamath National Forest – December, 2011 • Shasta-Trinity National Forest- December, 2012 • Six Rivers National Forest – December, 2013 |
| All Activities on Federal Lands USFS BLM | <u>Action</u> Implement management practices that meet the Standards and Guidelines required by the Northwest Forest Plan (1994) and meet the objectives of the Aquatic Conservation Strategy. <u>Timeline</u> Upon USEPA approval of the Klamath River TMDL Action Plan <u>Action</u> Implement the latest edition of the applicable Land and Resource Management Plan and any subsequent revisions given they are at least as stringent as the current requirements. <u>Timeline</u> |
| Timber Harvest Activities on Federal Lands Regional Water Board | <u>Action</u> Incorporate implementation measures that meet the TMDL allocations into the Categorical Waiver for Discharges Related to Timber Harvest Activities on Federal Lands Managed by the USFS in the North Coast Region (Resolution R1-2004-0015) when it is revised. <u>Timeline</u> Adopt the updated wavier by December 2009. |
| Timber Harvest Activities on Federal Lands USFS BLM | <u>Action</u> Implement management practices that meet the performance standards contained in <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> guidance document. The selected practices shall be included in the project document prepared pursuant to the National Environmental Policy Act (NEPA), the timber sale contract, and/or other controlling documents used to administer the project. <u>Timeline</u> Timelines for implementation of the selected practices shall be included in the NEPA document, timber sale contract and/or other controlling documents. |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|--|
| <p>Grazing on Federal Lands</p> <p>Regional Water Board</p> | <p><u>Action</u> Include TMDL measures for grazing activities that meet TMDL allocations in the proposed waivers of WDRs for all activities on federal lands.</p> <p><u>Timeline</u> See timeline for development of conditional waivers of WDRs for all activities on federal lands specific to each National Forest.</p> <p><u>Action</u> The Regional Water Board Executive Officer may require a monitoring plan for a particular grazing allotment to track implementation of management measures and/or assess impacts to water quality.</p> <p><u>Timeline</u> As needed.</p> |
| <p>Grazing on Federal Lands</p> <p>USFS</p> <p>BLM</p> | <p><u>Action</u> The management practices selected to control the impacts of grazing activities and comply with the TMDL shall be included in the project document prepared pursuant to the National Environmental Policy Act (NEPA), the Allotment Management Plan, Annual Operating Instructions and/or other controlling document(s) used to manage grazing allotments on federal lands.</p> <p><u>Action</u> Update current Allotment Management Plans to meet TMDL allocations by adapting management measures as needed.</p> <p><u>Timeline</u> The USFS and BLM shall submit updated Allotment Management Plans in the Klamath River basin for Regional Water Board review within one year of USEPA approval of the Klamath River TMDL Action Plan.</p> |
| <p>Road Construction and Maintenance on Federal Lands</p> <p>Regional Water Board</p> | <p><u>Action</u> Include implementation measures for road construction and maintenance that meet TMDL allocations in the proposed waivers of WDRs for all activities on federal lands.</p> <p><u>Timeline</u> See timeline for development of conditional waivers of WDRs for all activities on federal lands specific to each National Forest.</p> |

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Table 4-17 Klamath River TMDL Implementation Actions

| Source or Land Use Activity and Responsible Party | Actions to Address TMDL Impairments |
|--|--|
| Road Construction and Maintenance on Federal Lands USFS BLM | <p><u>Action</u> For excess sediment discharges from roads on federal lands, the USFS and BLM shall:</p> <ol style="list-style-type: none"> 1. <u>Inventory</u>: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from each source. 2. <u>Prioritize</u>: Prioritize efforts to control discharge of excess sediment from each source based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility. 3. <u>Schedule</u>: Develop a schedule to implement the cleanup of controllable sediment discharge sites. 4. <u>Implement</u>: Develop and implement feasible sediment control practices to prevent, minimize, and control the sediment source discharges. 5. <u>Monitor and Adapt</u>: Use monitoring results to direct adaptive management measures in order to refine and adjust sediment control practices and implementation schedules until sediment discharge is reduced to a level that meets the TMDL load allocations and water quality standards. <p><u>Timeline</u> Within two years of USEPA approval of the Klamath River TMDL Action Plan, submit a list of prioritized sediment control sites and a time schedule for completing the necessary work. Submit annual progress reports thereafter.</p> <p><u>Action</u> Reduce road network and road densities in order to reduce the potential development of sediment sources and match road maintenance needs with available resources.</p> <p><u>Timeline</u> Beginning within two years of USEPA approval of the Klamath River TMDL Action Plan, submit annual progress reports on measures taken to reduce the road network and reduce road densities that include a discussion of funding levels and road maintenance needs.</p> |
| Fire Management on Federal Lands USFS BLM | <p><u>Action</u> To address post-fire sediment sources, implement management measures from the appropriate Land and Resource Management Plan</p> |

VI. Enforcement

The Regional Water Board shall take enforcement actions for violations of the Klamath River TMDL Action Plan where elements of the TMDL Action Plan are enforceable restrictions such as application of the waste discharge prohibitions or as required under a specific permit or order, as appropriate. If necessary Regional Water Board staff may propose appropriate enforcement actions for human activities that result in discharges, including but not limited to the removal or suppression of vegetation that provides shade to a water body in the Klamath River watershed. Enforcement implementation is ongoing. Nothing in this Klamath River TMDL Action Plan precludes actions to enforce any directly applicable prohibition or provisions found elsewhere in the Basin Plan or to require clean up and abatement of existing sources of pollution where appropriate.

VII. Monitoring

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Compliance Monitoring

Monitoring is an important component in determining the effectiveness of the TMDL implementation measures taken by the responsible parties. It is also important in determining the responsible parties progress towards meeting the TMDL allocations. Monitoring by responsible parties shall be conducted upon the request of the Regional Water Board Executive Officer in conjunction with existing and/or proposed activities that have the potential to contribute to the TMDL impairments in the Klamath River basin. Monitoring may involve implementation, upslope effectiveness, photo documentation, instream and near-stream effectiveness, and / or instream water quality monitoring. The Regional Water Board Executive Officer will base the decision to require monitoring on site-specific conditions, the size and location of the discharger's ownership, and/or the type and intensity of land uses being conducted or proposed by the discharger. If monitoring is required, the Regional Water Board's Executive Officer will direct the discharger to develop a monitoring plan and may describe specific monitoring requirements to include in the plan.

Basin-wide Monitoring

Basin-wide TMDL monitoring will be coordinated with other monitoring efforts in the Klamath River basin. The overall goal of the TMDL monitoring is to track progress towards meeting the water quality standards and the TMDL allocations established by the Klamath River TMDL Action Plan. Monitoring results will also be used to reassess the effectiveness and appropriateness of the Klamath TMDL Action Plan and to make revisions as necessary.

The objectives of the monitoring plan include:

- Assessment of water quality standards attainment,
- Verification of pollution source allocations,
- Calibration or modification of the model used in the TMDL analysis,
- Evaluation of progress towards meeting TMDL allocations,
- Evaluation of point and nonpoint source control implementation and effectiveness,
- Evaluation of instream water quality,
- Evaluation of temporal and spatial trends in water quality,
- Evaluation of the risk to public health related to cyanobacteria and cyanotoxin exposure,
- Evaluation of the functionality of thermal refugia in the mainstem Klamath River, and
- Provide data for the development of the Klamath River basin water quality improvement accounting and tracking program.

The Klamath River TMDL monitoring plan is complimentary to other basinwide monitoring programs in the Klamath Basin including the Klamath River Basin Water Quality Monitoring Coordination Group and the Klamath Hydroelectric Project Agreement in Principle Interim Measure 12 Water Quality Monitoring Plan.

VIII. Reassessment and Adaptive Management

The Regional Water Board will review, reassess, and possibly revise the Klamath River TMDL implementation plan. Regional Water Board staff will report to the Regional Water Board at least yearly on the status and progress of implementation activities, and on whether current efforts are reasonably calculated and on track to achieve water quality standards. Within five years from USEPA approval of the Klamath River TMDL Action Plan, Regional Water Board staff will conduct a comprehensive and formal assessment of effectiveness of collaborative efforts in the on-going programs and the additional measures recommended by the Implementation Plan. A more extensive reassessment will occur 10 years from the date the Klamath River TMDLs are in effective, or sooner, if the Regional Water Board determines it necessary. During reassessment, the Regional Water Board will consider how effective the requirements of the TMDL implementation plan are at meeting the TMDLs, achieving water quality objectives, and protecting the beneficial uses of water in the Klamath River basin.